

KOHASHI

Serial No. 09/777,922

when the apparatus is used in the optical pickup an auxiliary beam directed from an optical disk to the lower part of one of the end surfaces is scattered by the conductive die-bonding paste adhering thereto.

15. (New) The apparatus of claim 14, wherein a highest position of the conductive die-bonding paste on said lower part of each end surface of the chip is at a height of more than 0.01 mm from the bottom of the chip.

16. (New) The apparatus of claim 14, wherein a highest position of the conductive die-bonding paste on said lower part of each end surface of the chip is within 0.04 mm of the light emitting point.

REMARKS

This is in response to the Office Action dated September 7, 2001. Claims 4-9 have been canceled, without prejudice in view of the Restriction Requirement. New claims 10-16 have been added. Thus, claims 1-3 and 10-16 are now pending. Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached page(s) is captioned "**Version With Markings To Show Changes Made.**"

Claims 1-3 stand rejected under 35 U.S.C. Section 103(a) as being allegedly unpatentable over Takahashi (US 5,627,851). This Section 103(a) rejection is respectfully traversed for at least the following reasons.

Claim 1 requires that, *inter alia*, "the conductive die-bonding paste adheres to a lower part of each end surface of the chip, and a highest position of the conductive die-bonding paste on said lower part of each end surface of the semiconductor laser chip is at a height of more than 0.01 mm from the bonding surface and hence from the bottom of the semiconductor laser chip, but is below the light-emitting point of the semiconductor laser chip." For example and without limitation, see Fig. 3 of the instant application where the conductive die-bonding paste 20 adheres up the vertically oriented end surfaces of laser chip 5, so that the conductive paste 20 extends up each end surface of the chip at least 0.01 mm from the bottom of the chip 5 but stops short of the light-emitting point of the chip 5. This advantageous aspect of certain embodiments of this invention enables, for example and without limitation, (a) a main beam returning to the chip from a disk (e.g., in a three beam system) to enter the light emitting point since it is not covered up by the paste, and (b) a returning auxiliary beam directed from the disk toward the lower part of the end surface to be scattered by the conductive paste. As a result, noise can be reduced and/or prevented in a disk signal.

In contrast to the invention of claim 1, Takahashi's adhesive 104 does **not** extend up the end surface of light emitting device 101. This aspect of claim 1 is clearly missing from Takahashi, and is not suggested or hinted at therein. As a result, the advantages associated with certain embodiments of the instant invention cannot be achieved in Takahashi. Thus, Takahashi cannot possibly render claim 1 obvious.

In paragraph 2 of the Office Action, it is stated that it "would have been obvious to one of ordinary skill in the art at the time of the invention to elevate the emitting surface

of the semiconductor chip . . ." This has nothing to do with the invention of claim 1, and it appears as if the instant invention may have been misunderstood. An important feature of claim 1 is the conductive paste extending up an end surface of the chip at least 0.01 mm but stopping short of the light emitting point. This enables the adhesive on the end surface(s) to scatter light as mentioned above, thereby reducing undesirable noise.

Whether the emitting surface of the chip is "elevated" is unrelated to this, as Takahashi fails to disclose or suggest the adhesive on a chip end surface as required by claim 1.

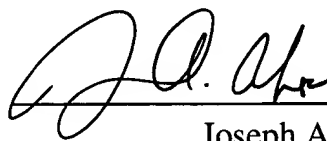
New claims 12-13 require that the conductive die-bonding paste comprises epoxy resin and at least 80% by weight conductive filler of metal particles or flakes. Takahashi fails to disclose or suggest this. There is no suggestion in the art of record of this feature of claims 12-13.

For at least the foregoing reasons, it is respectfully requested that all rejections be withdrawn and the application passed to issue. If any minor matter remains to be resolved, the Examiner is invited to telephone the undersigned with regard to the same.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS

Please cancel claims 4-9, without prejudice in view of the Restriction Requirement.

1. (Amended) A semiconductor laser apparatus [having] comprising a semiconductor laser chip whose bottom is die-bonded to a bonding surface with a conductive die-bonding paste, said semiconductor laser chip having a light-emitting point at each of opposed end surfaces thereof,

wherein the conductive die-bonding paste adheres to a lower part of each end surface of the chip, and a highest position [at which] of the conductive die-bonding paste [adheres to the end surfaces] on said lower part of each end surface of the semiconductor laser chip is at a height of more than 0.01 mm from the bonding surface and hence from the bottom of the semiconductor laser chip, but is below the light-emitting point of the semiconductor laser chip.

Please add the following new claims:

10. (New) The apparatus of claim 1, wherein the apparatus is provided in an optical pick-up using a three-beam scheme.

11. (New) The apparatus of claim 1, wherein the highest position of the conductive die-bonding paste on said lower part of each end surface is within 0.04 mm of the light-emitting point.

12. (New) The apparatus of claim 1, wherein the conductive die-bonding paste comprises epoxy resin and at least 80% by weight conductive filler of metal particles of flakes.

13. (New) A semiconductor laser apparatus comprising:
a semiconductor laser chip die-bonded to a bonding surface with a conductive die-bonding paste, said semiconductor laser chip having a light-emitting point at at least one end surface thereof,

wherein a highest position at which the conductive die-bonding paste adheres to at least one end surface of the semiconductor laser chip is at a height of more than 0.01 mm from the bonding surface, but is below the light-emitting point of the semiconductor laser chip; and

wherein the conductive die-bonding paste comprises epoxy resin and at least 80% by weight conductive filler of metal particles or flakes.

14. (New) A semiconductor laser apparatus for use in an optical pickup using a three-beam scheme for optical disks, the semiconductor layer apparatus comprising a semiconductor laser chip whose bottom is die-bonded to a bonding surface with a

conductive die-bonding paste, said semiconductor laser chip including a light-emitting point at each of opposed end surfaces thereof,

where the conductive die-bonding paste adheres to a lower part of each end surface of the chip from the bottom up to a height below the light emitting point so that when the apparatus is used in the optical pickup an auxiliary beam directed from an optical disk to the lower part of one of the end surfaces is scattered by the conductive die-bonding paste adhering thereto.

15. (New) The apparatus of claim 14, wherein a highest position of the conductive die-bonding paste on said lower part of each end surface of the chip is at a height of more than 0.01 mm from the bottom of the chip.

16. (New) The apparatus of claim 14, wherein a highest position of the conductive die-bonding paste on said lower part of each end surface of the chip is within 0.04 mm of the light emitting point.